REMARKS/ARGUMENTS

Claims 9-18 were pending. No amendments have been made. Claims 9-18 remain pending after entry of this response.

Claims 9-18 are rejected under 35 USC 103(a) as being unpatentable over USPN 4,774,556 to Fujii et al. ("Fujii") in view of JP 63288047 to Mori ("Mori") and Kao et al. ("Kao") IEEE, Vol. ED-34, 5/1987. This rejection is respectfully traversed.

Claim 9 distinguishes over Fujii, Mori, and Kao taken singly or in combination by reciting "(b) heating the substrate to at least about 1,100°C to form a first layer of silicon oxide ... inside the trench; and (c) forming a layer of silicon nitride on the first layer of silicon oxide."

In rejecting claim 9, the Examiner relies solely on Fujii. As best the paragraph starting with "-Re. Claims 9 & 14" at page 2 of the Office action can be understood, it appears that the Examiner refers to Fig. 6 and column 6, lines 9-59 of Fujii to show step (b) of applicant's claim 9, and then refers to the silicon nitride layer 5 in Fig. 15 of Fujii to show step (c) of claim 9. This is respectfully traversed because nitride layer 5 in Fig. 15 is formed over a tunnel oxide film 41 which is formed by oxidizing the silicon surface "under dry oxygen diluted with argon gas" (col. 9, lines 39-46), not by "heating the substrate to at least about 1,100°C" as recited in applicants' claim 9. Also, neither Fig. 6 nor the subsequent figures leading to the final structure shown in Fig. 9 show "forming a layer of silicon nitride on the first layer of silicon oxide" as recited in applicants' claim 9.

It appears that the Examiner relies on the method of forming oxide film 42 (Fig. 6) described at column 6, lines 36-42 of Fujii to show step (b) of applicants' claim 9, and relies on the method of forming silicon nitride layer 5 in Fig. 15 of Fujii to show step (c). This is improper because Figs. 6 and 15 of Fujii are related to two **distinct** embodiments. That is, nowhere in Fujii is there any teaching or suggestion that silicon nitride layer 5 in Fig. 15 could be formed over the oxidized film 42 shown in Fig. 6 because these two figures are completely unrelated. Fig. 6 of Fujii is a cross section view at an intermediate process step leading to the formation of the memory device shown in Fig. 9. This memory device is described in columns 5-8 and is referred to as "the first embodiment" (col. 5, lines 35-36). In contrast, the memory

device in Fig. 15 of Fujii is described in columns 9-11 and is referred to as "the third embodiment" (column 9, line 12). These two embodiments are distinct in structure, method of formation, and method of operation as described next.

The two memory devices shown in Figs. 9 and 15 are structurally distinct because the Fig. 9 memory device includes floating gates 51, 52 while the Fig. 15 memory device has no floating gates. The operations of the two memory devices are distinct in that the Fig. 9 memory device stores charge on floating gates 51, 52 (see col. 7:39-42 and col. 8:11-13), while the Fig. 15 memory device stores charge at the interface between tunnel oxide layer 41 and silicon nitride layer 5 (this interface is more clearly shown in Fig. 19 by reference numeral 411 - see col. 10:29-34 and col. 10:50-52). The methods of forming the two memory devices are distinct because forming the Fig. 9 memory device includes process steps for forming floating gates 51, 52 which the Fig. 15 memory device does not; and forming the Fig. 15 memory device includes process steps for forming silicon nitride layer 5 which the Fig. 9 memory device does not.

If it was the Examiner's intention to combine the teachings of the methods of forming the two distinct memory devices shown in Figs. 9 and 15 in the manner stated in the Office action, such combination would be improper because no motivation can be found for combining them in this manner. In fact, no motivation has been provided in the Office action for such combination. Further, such combination requires that the 20-100Å thick tunnel oxidized film 41 in Fig. 15 be replaced with the 500-1000Å thick oxidized film 42 shown in Fig. 6. Modifying the Fig. 15 structure in this manner would render the Fig. 15 non-volatile memory device unsatisfactory for its intended purpose of storing data for the reasons stated next.

Tunnel oxide is a thin layer of oxide carefully engineered to enable tunneling of electrons for the purpose of programming and erasing the non-volatile memory device. Fujii forms tunnel oxide layer 41 of 20-100Å by using dry oxygen diluted with argon gas (see Fig. 15 and col. 9:39-43). In contrast, oxide layer 42 in Fig. 6 is thermally formed to have a thickness of 500-1,000Å using dry oxygen at a temperature from 1,000-1,050°C (see col. 6:36-41). To replace the 20-100Å tunnel oxide layer 41 in the Fig. 15 memory device with the 500-1000Å thick thermally oxidized film 42 in Figs. 6 and 9, as suggested by the Examiner, would result in a non-volatile memory device which would not program or erase because no tunneling of electrons

can occur through the thick thermally oxidized film 42. This would render the non-volatile memory device in Fig. 15 non-satisfactory for its intended purpose of storing data.

Thus, claim 9 and its dependent claims 10-13 and 17-18 distinguish over Fujii at least for the above reasons.

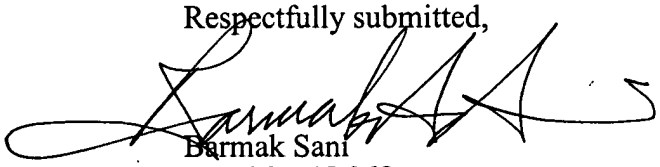
Claim 14 includes similar limitations to those of claim 9 recited above. Thus, claim 14 and its dependent claims 15-16 distinguish over Fujii for at least the same reasons stated above.

CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance and an action to that end is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 650-326-2400.

Respectfully submitted,



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